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Spiral Cut Helical Lead vs Standard

Earth Contact Products

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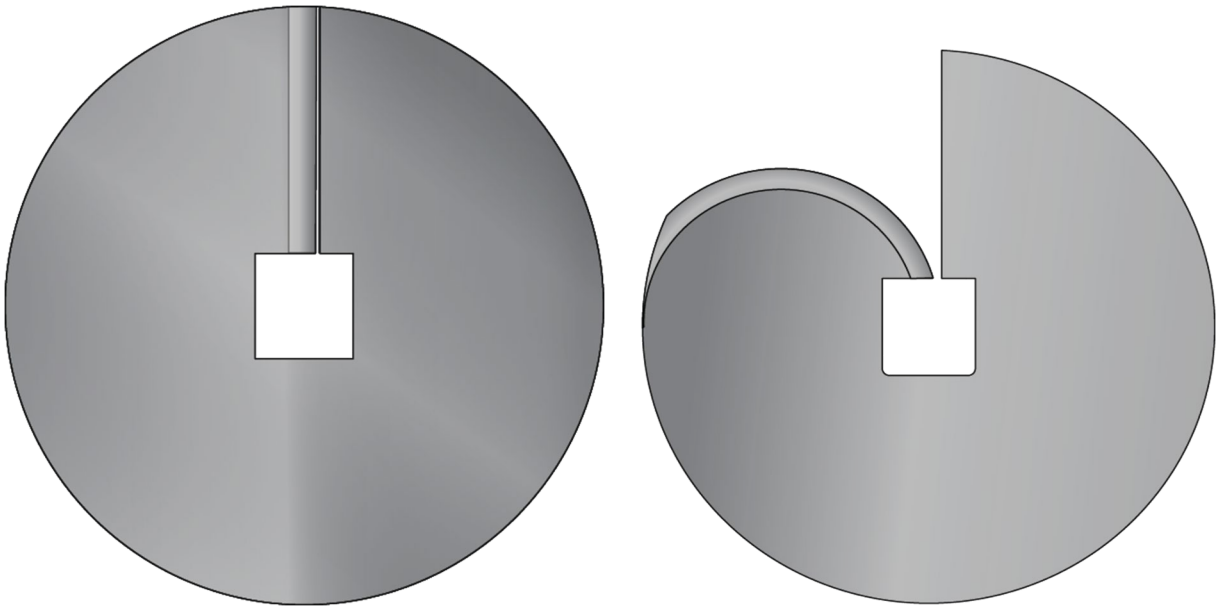


Standard Helix

Spiral Cut (Seashell) Helix

Helical Piles, also known as helical anchors or screw piles, are a type of deep foundation system used to support structures by transferring loads to the underlying soil or rock. They consist of a steel shaft or tube with one or more helical-shaped plates, often referred to as helices attached to it.

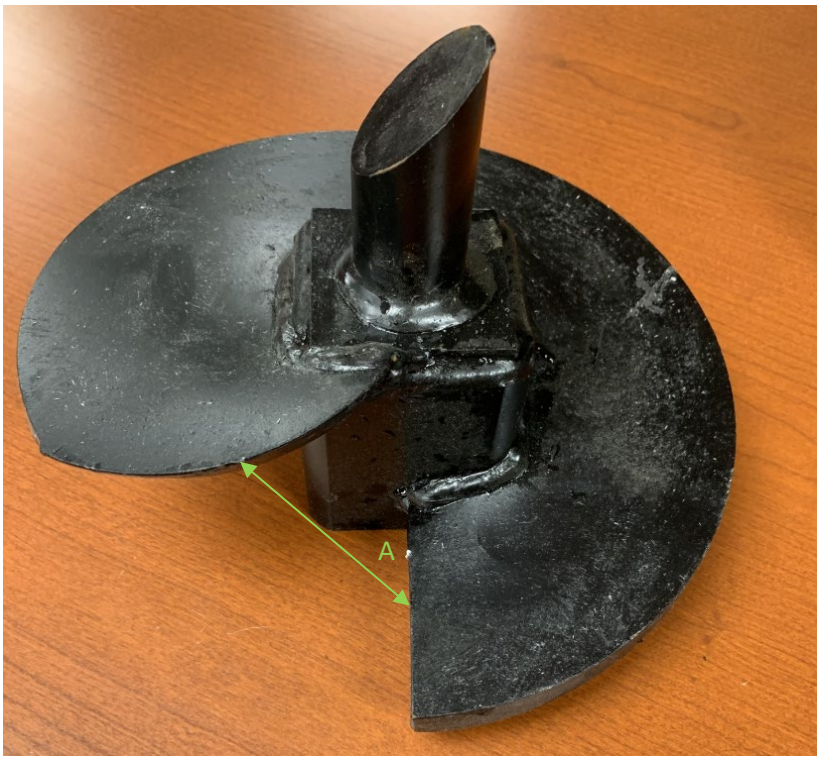
ECP offers 2 styles of lead helical plates, Standard and Spiral Cut. The Spiral Cut helix is also known as the Seashell Helix. Helicals are designed to provide bearing capacity and increase the lateral stability of the pile. The size and configuration of the helical plates vary depending on the specific design requirements and soil conditions. Strong soils are more suited to support foundations, and therefore require less helical surface area to develop sufficient lifting capacities, whereas weaker soils will require more surface area to attain the same support.

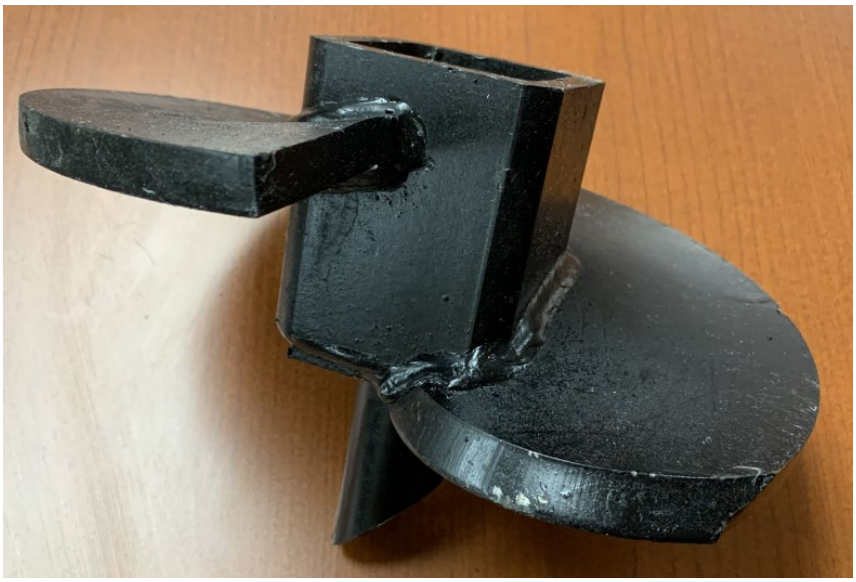
During installation, a helical pile is rotated into the ground using hydraulic machinery or specialized equipment. As the pile advances, the helical plates cut through the soil, creating a path for the pile to penetrate deeper. The helical shape of the plates helps to minimize soil disturbance during installation and provides additional resistance against vertical and horizontal forces.

The standard helical is perfect for maximizing lifting capacity. The seashell helix is designed to be utilized in situations with treacherous soil. Fill that is packed with cobbles and debris may damage the standard helix and cause it to stall if it gets caught on said debris. This problem led to the inception of the seashell helix. The seashell is designed to navigate through these tumultuous soils without these issues. By having less area to get caught on cobbles, and an elongated tapered edge designed to traverse problematic soil with ease, the seashell helix is the perfect solution for rocky soils where other helical piles just won't cut it. The tradeoff here is the helix sacrifices 10% of the surface area responsible for attaining lift to have this optimized form. It is worth noting that ECP structural specialists will account for this when sizing helical products for your specific needs.

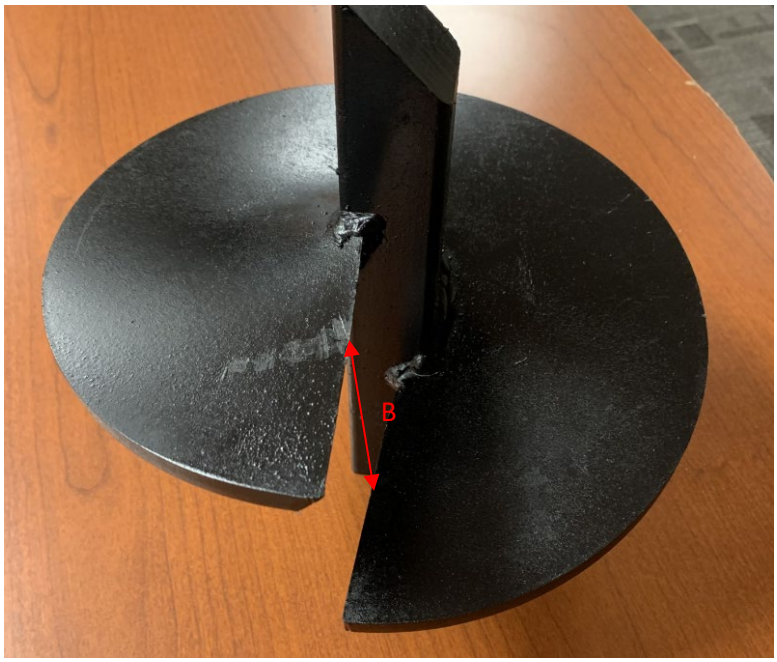
Once the desired depth and load-bearing capacity are achieved, the helical pile remains in place and can serve as a foundation for various structures, such as buildings, bridges, transmission towers, light poles, or retaining walls. The load from the structure is transmitted through the pile shaft to the helical plates, which transfers the load to the surrounding soil or rock.

The following pictures are of an extreme 10" seashell helical.





The following pictures are of a 10” PITA helical.



From these pictures you can start to get a better sense of how this simple change in geometry can have such a significant impact on these helicals' ability to traverse the soil they embed within. The minimum distance between the two edges of the helical, measured from the midpoint of the leading edge, represented by the red line (B) in the picture above, is 3 inches (the pitch of the helix). However, the same measurement, depicted by the green line in the first image (A), is 3-1/2". A half inch increase in gap size may not seem like a lot, but it is a 17% increase in gap size. This means that where a 3-1/4" cobble may cause trouble to a standard helix, the seashell will allow it to pass through no problem. It also cannot be overstated how beneficial the seashell can be for

cobbles larger than the gap will allow to pass. Upon colliding with a large cobble, the standard helix will apply direct pressure upon the obstacle, causing torque spikes. Alternatively, the curved edge of the seashell allows the helix to position its momentum to move the hinderance out of the way by guiding it along its curved edge.

The following image shows the direction of pressure (green) applied to cobbles or debris when encountered during the installation process, and the resulting direction of movement of said obstruction (red):